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# Charting Rhythmic Energy in Nuyorican Salsa Music

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# Charting Rhythmic Energy in Nuyorican Salsa Music

by

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# Abstract

## Charting Rhythmic Energy in Nuyorican Salsa Music

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There are many statements from members of the salsa community (including scholars, musicians, and dancers) that mention the presence, gaining, or waning of metaphorical rhythmic energy. Since many salsa sources employ ethnomusicological, biographical, or performance approaches, however, any text briefly mentioning musical energy would not require validation for energetic claims. Adopting a music-theoretical approach, this report focuses on how the rhythm section contributes to energy perceptions. Syncopation—or metrical dissonance—underlies metaphorical energy in salsa. This syncopation appears in individual rhythmic patterns and layered polyrhythms called *rhythmic profiles*, which correspond to energy-level associations with particular instruments and formal sections. Additionally, rhythmic changes on the larger formal

scale as well as on a smaller motivic scale can account for the perception of changes in energy levels.

This report presents a method for analyzing metrical dissonance in Nuyorican salsa, after reviewing the relevant theoretical tools by Harald Krebs and Yonatan Malin and surveying the core features of this subgenre. The last step of my method merges its earlier steps into a comprehensive energetic trajectory, a charted visualization of the temporal flow of rhythmic energy. I then apply the analytical method to a complete recording, Ray Barretto's version of "El hijo de Obatalá." This analysis demonstrates how the energetic trajectory mirrors distinct musical events and how rhythmic parameters directly contribute to the perception of energy flowing across an entire recording.

This music-analytical approach, I hope to show, provides an answer to how salsa's rhythm motivates energetic perceptions and associations of musical energy. While rhythm is never the only parameter contributing to perceived energy, it seems to be the primary contributor in salsa music. This report could also inspire further related research on salsa music, including topics such as style analysis and applications to dance.

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## List of Examples

*Understanding and exploring salsa's percussion instruments is vital to any instrumentalist seeking the secrets of this music.* — Rebeca Mauleón[1]

*[I]n salsa music rhythm is extremely important. Rhythm is the driving force.* — Marisol Berríos-Miranda[2]

*The piano begins playing a guajeo pattern, providing rhythmic drive that also contributes to the heightened energy level.* — Christopher Washburne[3]

*"I decide where energy level changes are going to take place. Energy change is important. … The treatment of percussion… can provide shifts in energy level in salsa performance."* — Arranger Ricky Gonzalez[4]

The salsa community—including scholars, musicians, and dancers—references rhythm and the rhythm section more than any other musical aspects when discussing energy, drive, or intensity in New York's salsa music. There are many other quotations from salsa sources that mention the presence, gaining, or waning of metaphorical rhythmic energy.[5] When I came upon any of these quotations, though, I always returned to two questions: (1) how can rhythm convey a sense of energy that everyone seems to share? and (2) how can this energy change over the course of a song? This report attempts to answer these questions.

Many of the salsa scholars employ ethnomusicological, biographical, or performance approaches. In these contexts, any text briefly mentioning musical energy would not require validation for such claims. Analytical evidence from the music-

[1] Rebeca Mauleón, *Salsa Guidebook for Piano and Ensemble* (Petaluma, CA: Sher Music Co., 1993), 174.
[2] Marisol Berríos-Miranda, "Is Salsa a Musical Genre?" in *Situating Salsa: Global Markets and Local Meanings in Latin Popular Music*, 23-45 (New York: Routledge, 2002), 35.
[3] Christopher Washburne, "Salsa Romántica: An Analysis of Style," in *Situating Salsa: Global Markets and Local Meanings in Latin Popular Music,* 101-119 (New York: Routledge, 2002), 115.
[4] Washburne, "Salsa Romántica," 113. This quotation is part of an interview in the chapter.
[5] In her guidebook, Mauleón often uses phrases such as "dropping dynamically," but the context implies energy level as opposed to volume.

theoretical perspective could provide an answer to how salsa's rhythm creates energetic associations and perceptions of musical energy. In so doing, this report focuses on how the rhythm section contributes to energy perceptions. I hope to demonstrate that syncopation underlies metaphorical energy in salsa. Differing degrees of syncopation—or metrical dissonance—for individual rhythmic patterns and layered polyrhythms correspond to energy-level associations with particular instruments and formal sections. Additionally, rhythmic changes on the larger formal scale as well as on a smaller motivic scale can account for the perception of changes in energy levels.

To assert these claims, I build upon the rhythmic theories put forth by Harald Krebs and Yonatan Malin.[6] This report's first section synthesizes the relevant concepts from Krebs's metrical dissonance model and Malin's additions regarding the metaphor of rhythmic energy. My explanation for selecting this "Western" view of rhythms in reference to meter appears in this section as well. The second section offers a general description of the Nuyorican salsa style, including its core features and their specific energetic associations. The third section presents my proposed method of rhythmic analysis in salsa, directing Krebs's and Malin's theoretical tools to this new repertoire in order to propose a connection between rhythm and perceived musical energy. This method progresses from individual rhythms to the combined polyrhythms of the large-scale formal sections, then to the smaller scale, energy-provoking motives that connect those sections. The last step of the method merges the earlier steps into a comprehensive

[6] Harald Krebs, *Fantasy Pieces: Metrical Dissonance in the Music of Robert Schumann* (New York: Oxford University Press, 1999). Yonatan Malin, "Metric Analysis and the Metaphor of Energy: A Way into Selected Songs by Wolf and Schoenberg," in *Music Theory Spectrum,* 30, no. 1 (Spring 2008).

energetic trajectory, a charted visualization of the temporal flow of rhythmic energy. The report's final section applies my analytical method to a complete recording. This analysis demonstrates how the energetic trajectory can fit distinct musical events and how rhythmic parameters directly contribute to the perception of energy flowing across an entire recording.

## METRICAL DISSONANCE MODEL, EXPLAINED

To start, the theory of metrical dissonance analyzes rhythmic syncopation. Metrical consonance, Krebs argues, describes rhythms that align with the metrical pulse layer, and metrical dissonance describes those that do not align with that layer or, said differently, emphasizes beats other than metrically strong ones. In cut-time meter, metrically consonant rhythms emphasize the two half-note pulses; unaligned accentuations of the quarter- or eighth-note layers indicate metrical dissonance.[7] Krebs distinguishes between different types of metrical dissonance.[8] His theory analyzes and categorizes the following dissonances: grouping versus displaced, direct versus indirect, surface-level versus subliminal, and simple versus compound. However, I do not focus on the particular label of dissonances; instead, I compare their degree of dissonance.

Krebs also offers a list of factors for determining how an individual rhythm can "be more or less inherently dissonant than others."[9] Comprising the basis for my analytical approach, these factors are (1) length of cycle, (2) proximity to consonance,

[7] Krebs has a term for sub-beat dissonances: low-level dissonance (p. 53). However, I will not be using this term because I distinguish between quarter-note and eighth-note layers to indicate proximity to consonance.
[8] He also identifies multiple types of accents; I mostly use the standard, dynamic accents.
[9] Krebs, 57.

and (3) relative tightness.[10] In other words, longer patterns with syncopated accents just shy of metrically strong pulses and with fewer (or no) metrically aligned accents are more metrically dissonant. Elsewhere, he acknowledges additional factors contributing to comparative or "contextual intensity," including (4) the number of antimetrical attacks and (5) perceptibility or prominence of the dissonance—rhythmic foregrounding.[11]

These five factors work well with Afro-Caribbean influenced music. They allow the investigation of highly syncopated rhythms in a layered texture. My use of this theory will apply the first four factors (length, proximity to consonance, tightness, and number of antimetrical attacks) to determine intensity levels of individual rhythms, and with the fifth factor (rhythmic foregrounding), I will determine and compare contextual metrical dissonance levels for salsa's complete polyrhythms. Yet, Krebs's theory does not offer a connection to energy.

Malin's extension upon metrical dissonance theory introduces the energetic metaphor. His metaphor sharpens Krebs's analytical tool for my rhythmic analysis because it directly connects syncopation with the energy perceived in salsa music. In short, "syncopations embody a kind of tension," described elsewhere as "rhythmic energy," that "contribute[s] to waves of intensification."[12] To add, this metaphorical energy "can be transferred from one domain to another, say from… syncopations to a musical line," to orchestration, or to heightened metrical dissonance levels.[13] Therefore, syncopation provides the energy for musical change, particularly those associated with

[10] Krebs, 57. A fourth factor, "number of pairs of noncongruent layers" does not apply to this salsa study.
[11] Ibid., 58-9.
[12] Yonatan Malin, 67, 63, and 69.
[13] Ibid., 65.

'more.' My application of Malin's metaphor relates salsa's differing levels of metrical dissonance to either higher or lower levels of energy and highlights the moments of transference between parameters. Engaging this metaphor with rhythmic analysis supports the salsa community's energetic associations.

Most of the analytical work on salsa relates its rhythms to the clave—transcribed in Figure 3.[14] Alignment with the clave is a very important aspect of all salsa music, even for the rhythm section's standard patterns. One measure of two-measure patterns always corresponds to the 2-side of the clave, the other to the 3-side. The clave type (2:3 or 3:2) determines which measure of the patterns comes first in a recording or formal section.[15] There is, however, a more practical way to conceptualize these rhythms.

The "Western" perspective of relating rhythms to their meter is becoming standard for salsa musicians, band leaders, and dancers. With the relatively recent adoption of sheet music by salsa ensembles, it is essential for musicians, in particular, horn players to have classical training and rely upon the concept of meter so that they can read the scores, all notated in cut-time meter.[16] Moreover, most bandleaders tap or count off one measure of half-note pulses then one measure of quarter notes. They use the meter—not the clave—to orient the musicians, listeners, and dancers to the meter,

[14] "Part 2: In-Clave," in *La Epoca Re-Edited*. Documentary, dr. Josue Joseph, accessed October 18, 2014, http://www.laepocafilm.com/sales.html. Christopher Washburne, "Play It 'Con Filin!': The Swing and Expression of Salsa" (*Latin American Music Review,* 19, no. 2 (Autumn – Winter 1998). Here, the author compares improvisations that are considered to swing or not swing, determined by whether the improvised rhythms are "in clave," or align with the clave rhythms.

[15] One-measure patterns simply repeat during the clave's second measure. Measure-ordering does not affect my thesis because the entire rhythms are always present and because they never change their relations to downbeats. Also, the *claves* are an optional auxiliary instrument. When no performer plays the *claves* or its characteristic rhythm, the indication of 2:3 or 3:2 clave appears on the score; and the other percussionists coordinate accordingly.

[16] Washburne, "Salsa Romántica," 104.

downbeat, and tempo of the upcoming song. Given the also recent standardization of the dance, the basic step orients to the metrical downbeat especially when counted: 1-2-3—5-6-7, verbalizing a two-measure unit's quarter-note layer starting on the downbeat.[17]

A few scholarly accounts do refer to salsa's *syncopation*, implying a metrical conception. For Rebeca Mauleón, "The pulses of Afro-Cuban music accents beat 1 and 3 (in duple meter), yet most of the rhythmic patterns played by each instrument are highly syncopated."[18] Likewise, Charlie Otwell considers the pianist the "timekeeper" since its *guajeo* pattern "consistently emphasize[s] the first beat," the metrical downbeat.[19] As included below in the discussion of individual rhythms, Christopher Washburne's sonic images of percussive patterns place them in relation to the metrical pulse, not the clave.[20] Some scholars specifically allude to syncopated, metrically oriented rhythms as *creating* energy; Charles "Keil concurs by stating that vital drive can be supplied by creating tension against the pulse."[21] Similarly, "the syncopation of various instrument patterns, create a polyrhythmic intensity."[22] In conclusion, there is significant support for relating these Americanized Afro-Caribbean rhythms to the meter to which most participants are entrained. Building upon this assumption, my extension of Krebs's and Malin's models provides rhythmic analyses that explicate the scholarly claims of salsa's rhythmic energy.

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[17] Sydney Hutchinson, "Mambo On 2: The Birth of a New Form of Dance in New York City," in *CENTRO Journal* 16, no. 2 (Fall 2004): 132-3. The Razz M' Tazz basic step is not recognized in the salsa community; it occurs more in the ballroom sphere.
[18] Mauleón, 63.
[19] Robert L. Doerschuk, "Secrets of Salsa Rhythm: Piano with Hot Sauce," in *Salsiology: Afro-Cuban Music and the Evolution of Salsa in New York City*, ed. Vernon W. Boggs, 311-324 (New York: Greenwood Press, 1992), 321.
[20] Washburne, "Play It 'Con Filin!," 175-7.
[21] Washburne, "Play It 'Con Filin!,'" 173. The quotation references Keil's 1966 publication (p. 341).
[22] Mauleón, 64.

## NUYORICAN SALSA, DESCRIBED

There are many different regional and national subgenres or brands of salsa music. Each of these brands has created its own unique flavor by adding or adjusting certain musical ingredients.[23] It seems plausible that the analytical method I propose here applies to all salsa brands. However, in an effort to narrow the scope, this study focuses on "Nuyorican" salsa: that which is played or recorded in New York City by musicians mostly of Puerto Rican descent.[24]

Nuyorican salsa has developed many historical styles since the late 1960s—when the culinary term was first used as a genre label (although arguably even before, since the 1950s).[25] The following styles designate this brand's evolution: *salsa dura*—the late 60s through the 1970s—with most representative artists being under the Fania Records label (e.g. Hector Lavoe and Ray Barretto) and Willie Rosario; *salsa romántica*—the 1980s and 1990s—with artists such as Tito Nieves and Domingo Quiñones; and a dispersion of styles in the twenty-first century. One of these styles I call pop salsa, categorizing artists such as Marc Anthony and La India. Another is "old-school salsa," which restores older styles especially the sound of the 1950s Palladium mambo shown in the music of Latin

[23] Puerto Rico adopted a mostly identical version of the original salsa music (and dance) from New York. While similar, West Coast salsa often experiments more with instrumental choices and non-Latin genre fusions. Cuban salsa called timba often incorporates unique rhythms with its use of a drum kit and has different corresponding dances: *casino* style or *rueda*. Colombian-style salsa has extremely fast tempos well suited for their distinctive dance style with fast-moving steps. While this comparison of styles is not comprehensive, hopefully it communicates some of the main differences.

[24] Wilson Valentín-Escobar, "'Nothing Connects Us All But Imagined Sounds:' Performing Trans-Boricua Memories, Identities, and Nationalisms Through the Death of Héctor Lavoe," in *Mambo Montage: The Latinization of New York* (New York: Columbia University Press, 2001), 210.

[25] Cesar Miguel Rondón, *The Book of Salsa: A Chronical of Urban Music from the Caribbean to New York City*, tr. Frances R. Aparicio with Jackie White (Chapel Hill: University of North Carolina Press, 2008), 1.

Giants of Jazz, The New Swing Sextet, and Tito Rodríguez Junior (among others).[26] In this study, I will engage recordings from each category to demonstrate the method's encompassing applicability to the Nuyorican salsa brand.[27]

Although it is impossible to formulate a comprehensive definition of Nuyorican salsa music, all of New York's historical styles share certain core characteristics that allow a rather precise description.[28] Focusing on recorded music, the four core features are its "danceability," instrumentation, formal structure, and accompanimental polyrhythms.[29] The last three features have specific energy associations, all rhythmically related.

A general but crucial feature is that salsa, as dance music, must be danceable. This characteristic depends largely upon features such as tempo, length, and its polyrhythms (discussed below). This music's half-note pulse tempo of 85-110 beats per minute (BPM) allows the dancers to comfortably coordinate their basic steps with the passing quarter notes.[30] Limiting song length, moreover, from three and a half to six minutes tempers

[26] These twenty-first century categories follow those put forth by Keith Negus in "The Latin Music Industry" (p. 138). The other style indicated by Negus is pastiche or fusion salsa, a style this report will not address. The New Swing Sextet recorded during the *salsa dura* years but I include them in the old-school category because they continued the 1950's Palladium sound after it had gone out of fashion.
[27] There are no *salsa romántica* examples because there are few (even fewer well-known) Nuyorican artists from that style; most were Puerto Ricans recording on the island. Pop salsa, however, borrows most of *salsa romántica*'s stylistic traits, so the Marc Anthony analyzed example stands to represent both styles.
[28] These core features come from an unpublished article of mine entitled "Did the Palladium Ballroom Play Salsa?" These core features support the inclusion of Palladium mambo music in Nuyorican salsa's brand.
[29] I limited the present study's scope to recorded, not live, tracks because sound engineers can more precisely scrutinize, manipulate, and chose the exact balance of all the instruments at each second of a studio recording. This is a highly important aspect since my analytical method relies upon the foregrounding of rhythm section instruments.
[30] Hutchinson, 132-3. See footnote 17 for commentary.

dancers' exhaustion (and also fits the music industry's standard for radio-recording length).[31]

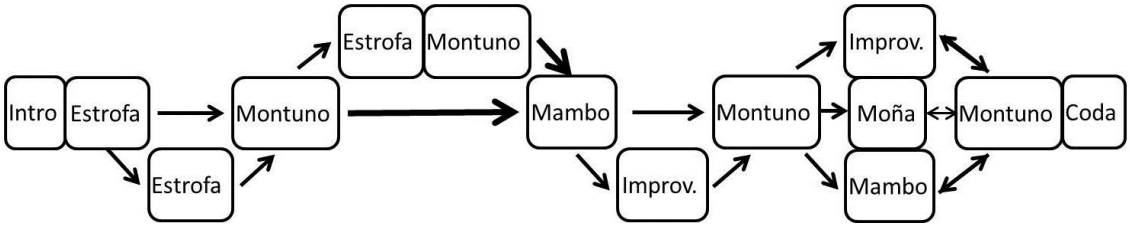
The necessary components of a salsa band belong to three sections.[32] The rhythm section has no less than a piano, bass, conga, timbales, and bongo. Auxiliary percussion that often appear include the *campana* (cowbell), claves, maracas, and maybe cymbal.[33] The horn section always has brass instruments, at least trumpets or trombones—possibly both. Baritone saxophones often double the bass line, and other instruments may be briefly featured as soloists. The vocal section typically has a *sonero* (lead singer) and *coro* (chorus). The instruments most often associated with energy are those of the rhythm section.

The instrumentation combines to elucidate the third core feature: form. Recordings mostly alternate between sections featuring either vocalists or horn players, but beyond this alternation the form is quite flexible, as shown in Figure 1.[34] Instrumental introductions lead to *estrofas* (verses) sung by the *sonero*. After one or two *estrofas* (perhaps separated by brief instrumental bridges), a *montuno* occurs in which the *coro* alternates a repeated phrase with the *sonero*'s *soneos* (short improvised lines).[35] This

[31] When salsa became more commercialized in the 1980s, one can observe a dramatic reduction in song length from five or six minutes to three and a half to four minutes.
[32] Christopher Washburne, *Sounding Salsa: Performing Latin Music in New York City* (Philadelphia: Temple University Press, 2008), 169-76.
[33] Other auxiliary percussion may be present like the *guiro*, but drum kits do not belong in Nuyorican salsa.
[34] Washburne, *Sounding Salsa*, 168-9.
[35] Mentioned in Mauleón's guidebook (p. 189), quick instrumental bridges may appear at formal boundaries, particularly between multiple *estrofas* or between an *estrofa* and *montuno*. Given their brevity, bridges do not appear in the standard formal graph, but they do appear in the repertoire.

initial *montuno* then typically pairs with a mambo, featuring the horns.[36] The horns may play a harmonized melody in a homophonic texture or—more commonly—play in a stratified texture with staggered entrances. After the mambo, an instrumental improvisation or *montuno* could follow. At this point, the form always returns to the *montuno* amidst intervening instrumental sections such as the mambo repeated, an improvisation, or most commonly, a *moña*. *Moña*s originally were improvised sections by the horn section in live performance (commonly in the style of stratified texture with staggered entrances), but they are distinguishable as instrumental features not melodically identical to the mambo.[37] Instrumental codas close a recording; they are often melodically akin, if not identical, to the introduction.

Figure 1: The possible paths for salsa's flexible form

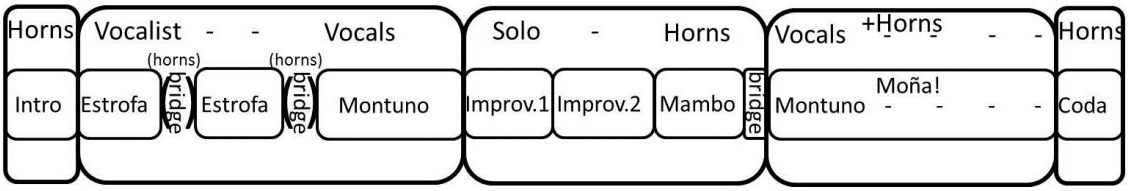



The formal structure of Ray Barretto's recording of "El hijo de Obatalá," shown in Figure 2, serves as an example of a typical recording's formal organization. This figure both exemplifies the flexible treatment of formal organization and groups the formal

[36] A second *estrofa* may happen after the first *montuno* instead of before (never both), but the *montuno* following the last *estrofa* usually leads to a mambo to keep its pairing.
[37] Washburne, *Sounding Salsa*, 168-9.

sections by instrumental feature to illustrate the vocal-horn alternation.[38] Although not included in this figure, grouping formal sections according to their specific energetic associations is also possible.

Figure 2: The form of "El hijo de Obatalá," grouped by featured instrumental section




The rhythm section's percussive polyrhythms are the most distinctive core feature of Nuyorican salsa, and they relate to the form. Every recording has this foundational layer composed of standard polyrhythmic patterns, what I call *rhythmic profiles.*[39] Example 1 presents transcriptions of the instrument-specific ostinati or patterns that comprise two rhythmic profiles (written in 2:3 clave).[40] A simple yet central aspect is salsa's cut-time meter. These two-beat measures always group into two-measure units, which build eight-measure phrases.[41] Also, this meter yields two layers of syncopation: quarter-note syncopations (on the second and fourth quarter notes) and eighth-note

[38] The present study's final section, which analyzes the entire piece, unpacks the formal idiosyncrasies.
[39] In her guidebook, Mauleón calls these polyrhythms, rhythmic styles (p. 186). Her guidebook has transcriptions of these two rhythmic profiles and labels LEP as "son montuno" (p. 201) and HEP as "mambo" (p. 206). My renaming seeks to avoid terms that have multiple-meaning in standard discourse.
[40] It is also possible to perform these rhythmic profiles with a 3:2 clave. To do so, the measures switch; the second measure of both rhythmic profiles occurs first.
[41] The two-measure units are due to the instrumental patterns lasting two measures. The corresponding basic steps also fill the two-measure unit.

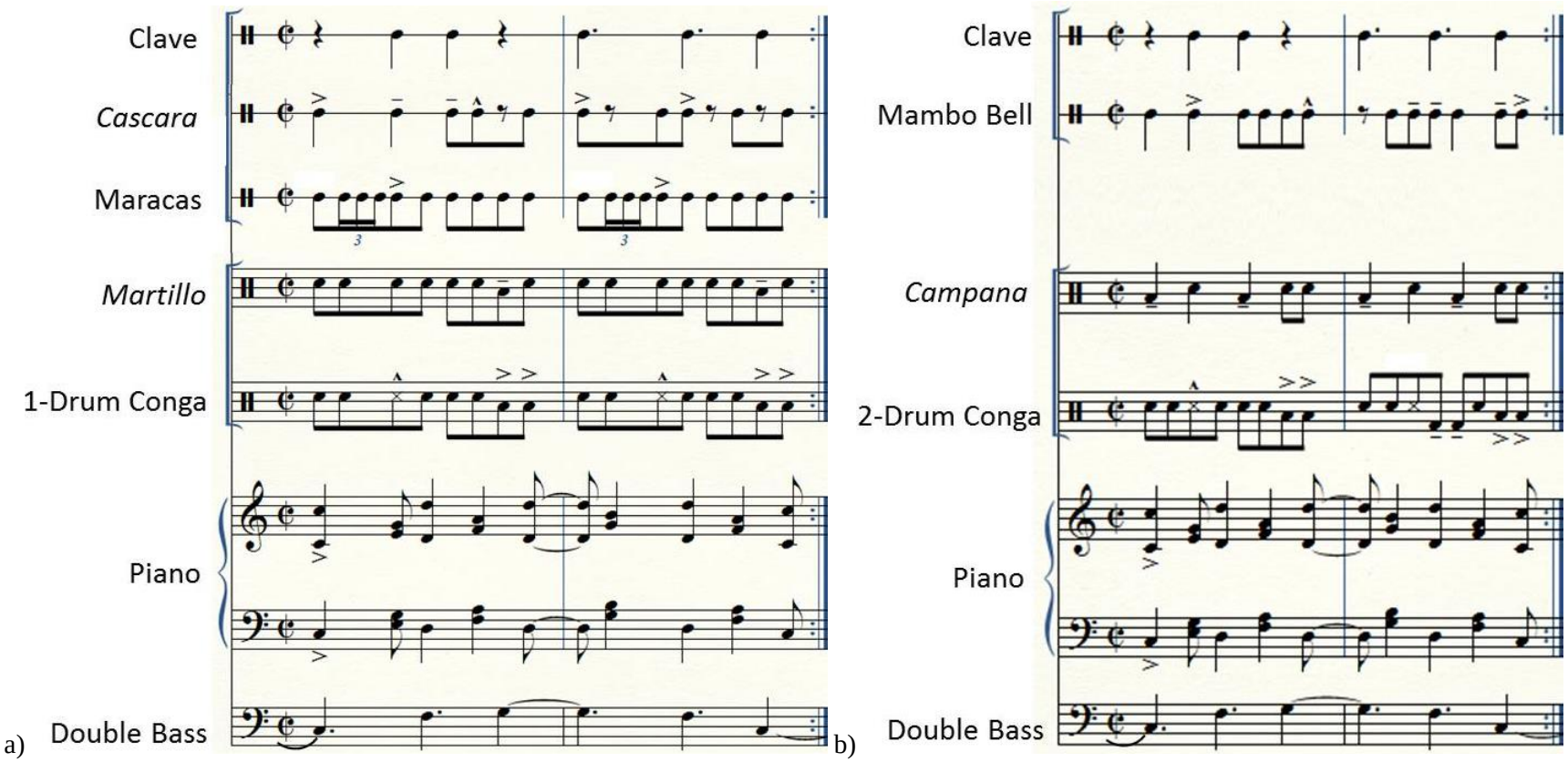
syncopations (those occurring between quarter notes).[42] The images in Example 1 align their patterns according to the performer. That is, the *timbalero* (timbales player) plays either the *cáscara* on the timbal's shell or the mambo bell pattern on an attached bell, and the *bongocero* (bongo player) switches instruments: from the *martillo* pattern on bongo to the *campana.* Another important detail in the transcriptions is the three degrees of note accentuation: *martelato*'s (^) designate the strongest accents; *marcato*'s (>), mildly accented notes; and *tenuto*'s (–), notes weighted by instrumental resonance properties or performance tendency.[43]

Every recording uses at least these two rhythmic profiles, and only the rhythm section contributes to this aspect of the salsa sound. Each rhythmic profile acts as an unchanging constant for particular formal sections: the low-energy profile (abbreviated LEP) in Example 1a accompanies introductions, *estrofas*, and codas; and the high-energy profile (HEP) in Example 1b accompanies *montunos*, mambos, and *moñas.*[44]

Scholarly accounts identify specific rhythm-section instruments and formal sections with either high or low energy associations. Each of these associations is based upon salsa's rhythmic parameter. Robin Moore provides this first example of the instrument associations; "[t]he timbales player… switches to a *driving* [mambo] bell

[42] These two layers clarify distinctions between which accents are more dissonant due to a closer proximity to metrically consonant pulses.
[43] The accentuation distinctions are clear in the rhythm's sonic images in Christopher Washburne's article "Play It 'Con Filin!'" (pp. 175-7) and reproduced in my section "Individual Rhythms." Washburne's article did not include all the percussive rhythms, but the other patterns' accentuations are audible in performance.
[44] My descriptive terms for these profiles reflect the energetic associations by the salsa community. Either rhythmic profile can accompany an instrumental improvisation, but usually rhythm section and *sonero* improvisation have LEP, whereas horns improvise over HEP.

Example 1: The two standard rhythmic profiles in Nuyorican salsa: a) high-energy profile (HEP) and b) low-energy profile (LEP)[45]

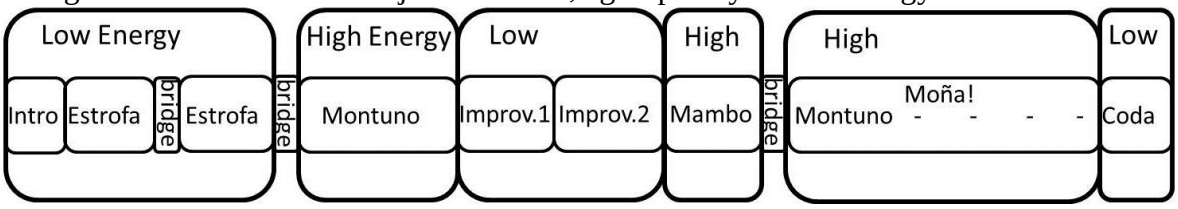



[45] The individual rhythmic patterns receive attention in a later section.

pattern" when HEP begins.[46] Likewise, Washburne states that "a return to the [*cáscara*] and bongos [after a *montuno*]… serves to gently decrease the energy level in order to smoothly return to the introductory material found in the instrumental interlude."[47]

Regarding formal sections, David García considers a defining aesthetic aspect of salsa to be "the interrelated kinesthetic and aural climax that marked the son montuno's diablo," now called the mambo.[48] Integrating the instrumental and formal associations, Steven Loza shares that "during the piano solo the bongo[c]ero, in order to relax the rhythmic intensity of the montuno section, returns to the bongos."[49] To summarize, the formal sections that have associations with higher energy levels are the *montuno*, mambo, and (typically) improvised solos by a horn player; and the lower energy sections are the introduction, coda, and *estrofas* (perhaps other improvised solos as well). Figure 3 regroups the formal structure of "El hijo de Obatalá" according to these associations in order to designate the perceived flow of energy in the form.

Figure 3: The form of "El hijo de Obatalá," grouped by formal energy associations[50]




[46] Robin Moore, "Cuba and the Hispanic Caribbean," in *Musics of Latin America*, 397-433 (New York: W.W. Norton & Company, 2012), 199. The emphasis is my own.
[47] Washburne, "Salsa Romántica," 115.
[48] David García, *Arsenio Rodríguez and the Transnational Flows of Latin Popular Music* (Philadelphia, PA: Temple University Press, 2006), 47.
[49] Steven Loza, "Poncho Sanchez, Latin Jazz, and the Cuban Son: A Stylistic and Social Analysis," in *Situating Salsa: Global Markets and Local Meanings in Latin Popular Music*, 101-119 (New York: Routledge, 2002), 208.
[50] The last two bridges do not have any rhythmic backing nor do short bridges have energy associations; therefore, they have no associations in the figure.

All of the above associations of high or low energy perfectly align with the distinction between rhythmic profiles. All instruments and formal sections exclusively linked to LEP have associations with lower energy levels, and those connected to only HEP seemingly have higher energy. While this relationship between rhythm and energetic associations is very clear, it is only the exterior surface; this report identifies rhythmic metrical dissonance as the interior element supporting their strong and specific correlation.

One can find 'rhythmic energy' in the syncopated patterns of the rhythm section. In my investigation of the rhythmic profiles below, I propose an explanation for these specific energetic associations. Being the most reliant upon rhythm and the deliverer of these profiles, the rhythm section and its contributions to the perception of energy warrant the focus of this present study.

## RHYTHMIC ENERGY METHOD, CHARTED

This section presents my method for analyzing Nuyorican salsa recordings by their energy levels. Using Krebs's five factors (length, proximity to consonance, tightness, number of antimetrical attacks, and rhythmic foregrounding), I first determine the metrical dissonance levels for each individual rhythm from the rhythm section. Second, upon inserting these rhythms into their context, I approximate the two rhythmic profiles' levels of contextual metrical dissonance based upon the contributing rhythms and their balance. Third, I relate to salsa Malin's assertion of the relationship and positive correlation between metrical dissonance and metaphorical energy. Fourth, I

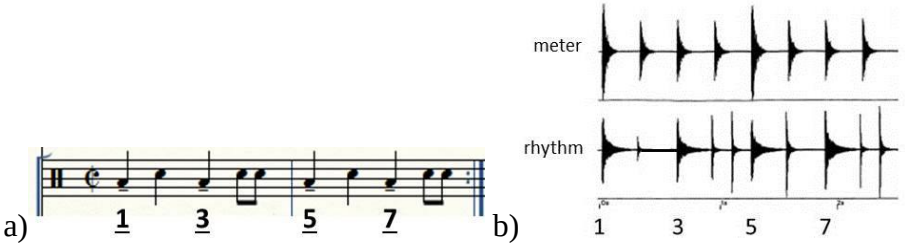
investigate the rhythmic properties of three characteristic motives that connect not only formal sections but also differences between their energy levels. Fifth and last, I use the rhythmically motivated energy levels of the formal sections and motives to chart the temporal energetic trajectory of Ray Barretto's recording of "El hijo de Obatalá." This recording offers many opportunities for comparing metrical dissonance levels, incorporates all of the energetic motives addressed below, and does not have many departures from the norms of Nuyorican salsa.

### 1: INDIVIDUAL RHYTHMS

Each pattern played by rhythm-section instruments has a particular level of metrical dissonance. Based upon Krebs's comparative factors, metrically consonant rhythms are shorter, have more metrical accents, have fewer syncopated accents, and these syncopated accents are farther from metrical pulses. Metrically dissonant patterns have the inverse of these features. An evaluation of each pattern, addressed in ascending order of metrical dissonance, follows.

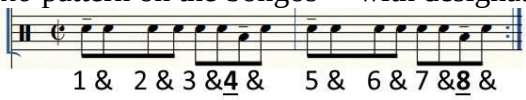
**Metrically Consonant.** The *campana* pattern, shown in Example 2a, is the most metrically consonant rhythm. The one-measure ostinato steadily emphasizes the metrical pulse by striking the better resonating portion of the bell on the half notes in cut-time meter, also called the core beats. Example 2b's visual representation of this rhythm's sonic characteristics shows the greater resonance, and therefore naturally weighted accent, of the notes occurring on the meter's half-note pulses. The less resonant pitches are often covered by the rest of the texture.

Example 2: The *campana* rhythm in a) standard score notation with a designated count of the accented pitches and b) sonic imaging[51]



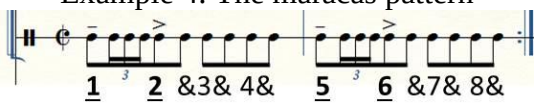

**Slightly Metrically Dissonant.** With one level of remove from metrical consonance, this level groups one-measure patterns with accentuation a full quarter note from the downbeat. Transcribed in Example 3, the *martillo* pattern's has a straight eighth-note subdivision on the bongos. The fourth quarter note receives accentuation by striking the lower, more resonant drum with the player's dominant hand.

Example 3: The *martillo* pattern on the bongos —with designated counts and accents




Similarly, the maracas pattern accents only its measure's second quarter note (see Example 4). A crescendo though the quick, preceding triplet notes prepares this accent. The rest of the pattern is straight, eighth-note subdivision.

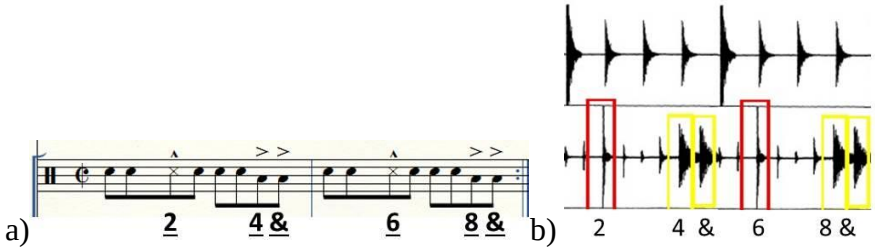
Example 4: The maracas pattern




[51] Washburne, "Play It 'Con Filin!,'" 175.

The one-drum conga pattern (also called a conga *tumbao*), shown in Example 5a, has more accentuations: two areas on the syncopated quarter notes of its one-measure pattern. Its strongest accent, the slap tone, occurs on the second quarter note; the mildly accented, open ringing tones occur during the measure's last quarter note.[52] These two eighths notes group together as a single accentuation point; the first eighth note acts as Krebs's "new-event accent," and the second is only an echoing re-articulation.[53] Example 5b demarcates the differing degrees of accentuation via its sonic imaging of the rhythm.

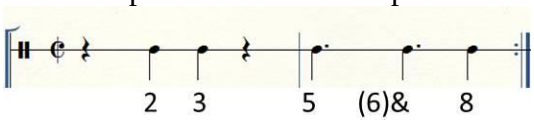
Example 5: The one-drum conga *tumbao* in a) score notation and b) sonic imaging[54]




**Moderately Metrically Dissonant.** Longer, two-measure patterns with more accents on both metrically strong beats as well as quarter-note and eighth-note syncopations comprise this level of metrical dissonance.[55] Combining both measures, the clave pattern plays on one downbeat, a metrically strong mid-measure beat, two syncopated quarter-note beats, and one eighth-note upbeat (Example 6).

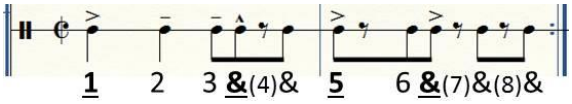
[52] In the full-band texture, the other notes of the rhythm are mostly inaudible.
[53] Krebs, 23. The slightly lower amplitude of the repeated pitches in Example 5b supports this decision.
[54] Washburne, "Play It 'Con Filin!,'" 176. I added the coloration to highlight different accent strengths.
[55] One missing level, preceding this one, would have short one-measure rhythms with these same kinds of accents (both metrically strong and syncopations on both quarter and eighth notes). However, only variations on the standard rhythms belong in this level; one example appears on page 24.

Example 6: The 2:3 clave pattern




The *cáscara* pattern played by the *timbalero* accents both downbeats in its pattern but also plays multiple syncopated quarter and eighth notes (Example 7). Also, two of the accented eighth-note syncopations are quite close in proximity to metrically strong pulses; therefore, this pattern has a slightly higher level of metrical dissonance.

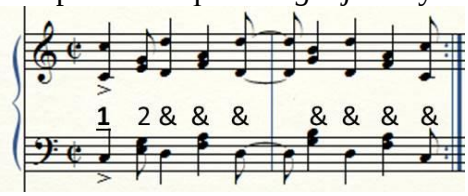
Example 7: The *cáscara* pattern




With an even higher number of syncopated notes—and thus higher metrical dissonance—is the piano's *guajeo* rhythm, shown in Example 8. After accenting the downbeat and playing the second quarter note, the pianist has a string of syncopated eighth notes for the rest of its two-measure unit. The high proximity to consonance, given the attacks on both eighths surrounding the second downbeat, also heightens the metrical dissonance of this pattern.[56]

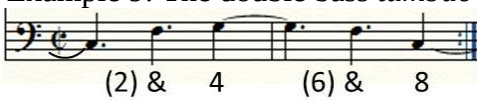
[56] All two-measure patterns are transcribed in 2:3 clave. The use of the 2:3 clave predominantly throughout the report is due to its more frequent use in the repertoire.

Example 8: The piano's *guajeo* rhythm




**More Metrically Dissonant.** The next levels have very tight metrical dissonances; they have no accents (or attacks for the bass) on metrical pulses. For this level, the double bass pattern (Example 9) known as the bass *tumbao* or "anticipated bass" is only one measure in length with no metrically consonant notes and with two attacks: a syncopated quarter note and a syncopated eighth note.[57] It is even harmonically syncopated and anticipatory by changing harmonies on the fourth quarter note, one beat before the rest of the ensemble changes.[58]

Example 9: The double bass *tumbao*

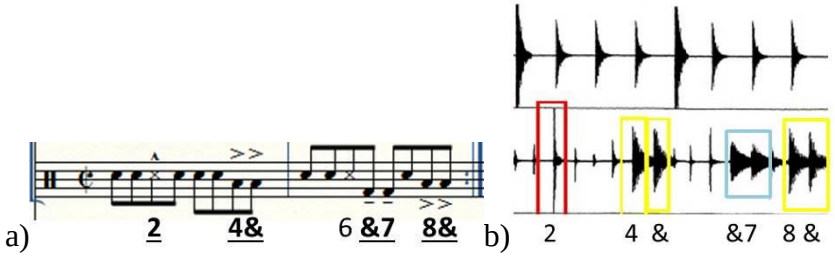



**Highly Metrically Dissonant.** This last level groups two-measure patterns that are quite tight (without downbeat accents) and emphasize syncopated quarter notes and eighth notes with many, slightly misaligned accents. Like the one-drum conga *tumbao*, the two-drum *tumbao* (see Example 10a) has quarter-note syncopations in both measures;

[57] Peter L. Manuel, "The Anticipated Bass in Cuban Popular Music," in *Latin American Music Review*, 6, no. 2 (Fall/Winter 1985): 249.
[58] This concept provides the reasoning for rhythm's term "anticipated bass."

however in the second measure, the player departs from the other pattern by projecting the eighth note just before the mid-measure pulse with open, resonating tones on the lower second drum. Again, all repeated tones are simply re-articulations of the previous note's new-event accent.[59]

Example 10: The two-drum conga *tumbao* in a) score notation and b) sonic imaging, illustrating all three degrees of accentuation[60]

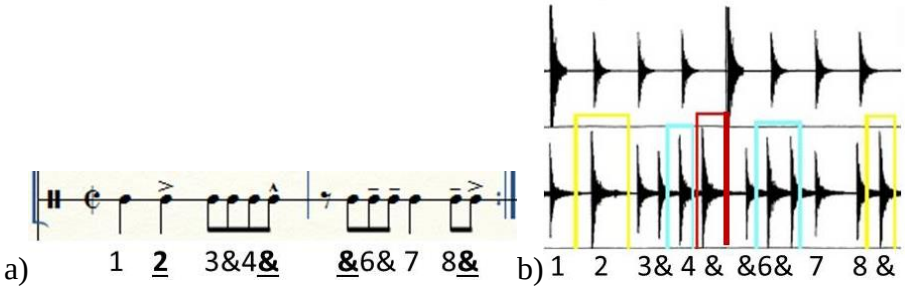



The *timbalero* plays the most syncopated rhythmic pattern on the mambo bell (Example 11a). This is due to the high number of syncopated accents—particularly on the eighth-note layer—and their close proximity to consonant pulses. This rhythm starts with an accent on the second quarter note, copying the rhythmic accentuation of the *conguero* (conga player). Afterward, though, this rhythm's strongest accent occurs on the last eighth note of the measure, with the notes before it leading dynamically toward this accent. This note provides close proximity to consonance, occurring one eighth note away from the following downbeat. Moreover, this strongest accent is followed by silence on the downbeat and the player re-enters the eighth note immediately after,

[59] The repeated pitches' slightly lower amplitude in the sonic imaging supports this decision.
[60] Washburne, "Play It 'Con Filin!,'" 176. I added the coloration to highlight different accent strengths.

another attack in close proximity to the downbeat. In further contribution to this rhythm's proximity to consonance, the very last eighth note of the second measure has the second strongest accent. The two eight-note beats during the sixth quarter-note pulse also receive weight but not as much as the aforementioned accents (shown in Example 11b). This entire rhythm is performed with the player's dominant hand, also giving it extra weight.[61]

Example 11: The mambo bell rhythm in a) score notation and b) sonic imaging[62]

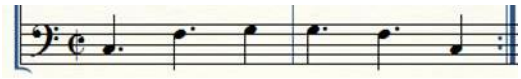



**Variations.** Rhythmic variations are possible for each instrument.[63] Some variations are, in fact, not variations but a borrowing of another (perhaps excluded) instrument's characteristic pattern, such as the *timbalero* replacing the *cáscara* pattern with the maracas pattern. Other variations consist of different rhythms entirely, which could affect a rhythm's degree of metrical dissonance.[64] For example, a bassist may choose to play on the downbeat (see Example 12). By including this metrically strong

[61] The *timbalero's* other palm beats the measure's second and fourth quarter notes on one of the *timbal* drums. I did not include this rhythm in the report because no observer can hear this soft rhythm in context, even with studio recordings. If the listener cannot hear the rhythm, it could not contribute to the perception of musical energy.
[62] Washburne, "Play It 'Con Filin!,'" 175. I added the coloration to highlight different accent strengths.
[63] There are in fact many possible patterns beyond the most standard *cáscara* and *guajeo* patterns.
[64] Another common option, as opposed to a strict ostinato, is spontaneous improvisation that might last for one measure or an entire formal section. Usually, though, these moments simply embellish its standard pattern. Lengthy spontaneous improvisation (less common) might alter its metrical dissonance level.

note (and the downbeat's agogic accentuation), the bass variation rhythm becomes much less metrically dissonant. This varied rhythm matches the three-side of the clave and thus adds another level of metrical dissonance, just below the clave: short, one-measure patterns with metrical accents along with quarter-note and eighth-note syncopations.

Example 12: Common variation of the bass *tumbao* with a new metrical dissonance level

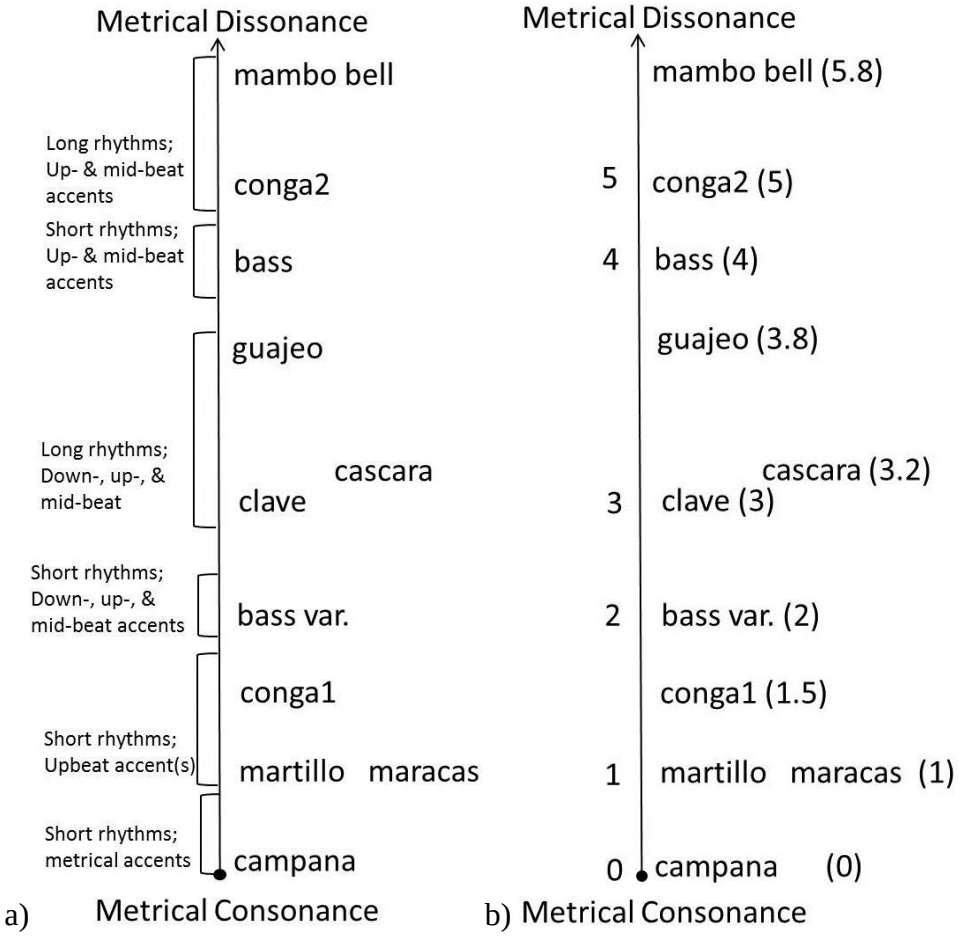


Combined in Figure 4, all of the rhythm section's standard patterns span a wide spectrum of metrical dissonance: from completely metrically consonant to highly metrically dissonant. For the listener, this relative comparison between degrees of metrical dissonance is sufficient. However, for the analyst studying the combination and treatment of multiple metrical dissonances in its polyrhythmic texture, a precise and quantitative designation for each pattern is most practical. Starting with the ordering of metrical dissonance levels in Figure 4a, one can overlay numeric values onto the five ordered levels. Furthermore, one can assign each pattern a number for its level and specific degree of metrical dissonance (Figure 4b). Ultimately, the most important factor is relative metrical dissonance, not exact numbers; but the numbers help to determine the average dissonance level when these rhythms combine contextually.[65] Each recording is the product of combinational choices between rhythms and variations that create its

[65] This also proposes a more rigorous method for comparing relative metrical dissonance.

rhythmic profiles. These musical choices affect the collective sound of the music and the interpreted collective metrical consonance or dissonance.

Figure 4: Metrical dissonances for all individual rhythms by the rhythm section, a) grouped by the different levels of metrical dissonance and b) with assigned numbers

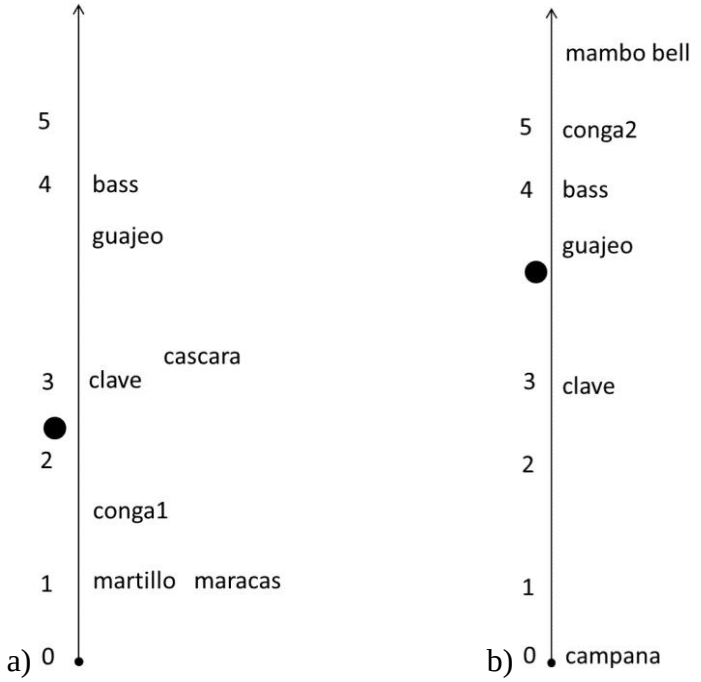



## 2: TWO RHYTHMIC PROFILES

By grouping the standard patterns into the two primary rhythmic profiles, general trends of contextual metrical dissonance emerge. As I show in Figure 5a, many of the patterns participating in LEP congregate on the less metrically dissonant half of the

spectrum—particularly those unique to LEP. As I show in Figure 5b, most of the patterns in HEP centralize around the more metrically dissonant half of the spectrum. Since these rhythms always appear within the context of a rhythmic profile, the average of the contributing patterns' individual values (identified in Figure 4b) can determine a general value for the contextual metrical dissonance of each rhythmic profile. The dots in Figure 5 mark the averaged values for both rhythmic profiles (2.5 and 3.6).[66] Most importantly, these general averages simply indicate that the level of contextual metrical dissonance is higher for HEP than for LEP, which is also audible.[67]

Figure 5: The instrumental patterns grouped by a) LEP and b) HEP




[66] These two average calculations assume one hears all rhythms of a rhythmic profile equally well in the texture. Without any rhythms put in the foreground or background, each rhythm's number is weighted equally in the calculation. The following paragraph discusses in detail rhythmic foregrounding and balance.
[67] Most importantly, the estimated "average" for contextual metrical dissonance is of no significant value (other than providing more rigorous calculations to support the larger argument). In salsa, perceptions of energy levels are always determined relatively or comparatively.

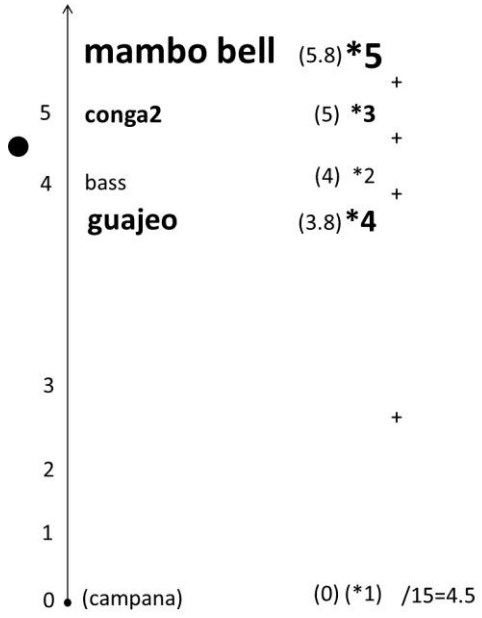
Certain rhythmic adjustments can further shape the contextual metrical dissonance level: variations and balance. An instrument's rhythmic variation with significantly less or more metrical dissonance (than its standard pattern) affects the sound of the rhythmic profile and the corresponding calculation for its contextual metrical dissonance. Likewise, if the rhythm section foregrounds particular rhythms, this also changes the sound of the rhythmic profile and its perceived metrical dissonance level. To reflect this aurally perceived change, the contextual calculation must weigh the individual values of each pattern according to its ranking in the balance and then take the average.[68] Despite any adjustments, however, it is apparent that the contextual metrical dissonance levels always stay within either LEP's lower range (2.9 and below) or HEP's higher range (3.5 and above).

Let us apply this more-refined calculation of contextual metrical dissonance (accounting for variations and balance) to musical excerpts. The effects of rhythmic foregrounding are clear in the final *montuno* of Hector Lavoe's recording of "Aléjate" [time stamp (t.s.) 6:22-56]. This *montuno* foregrounds the HEP's mambo bell, under it the piano's *guajeo*, then the two-drum conga pattern and behind that, the bass *tumbao* (Figure 6). Although foregrounded in other HEP sections, here the *campana* pattern drops to the very back of the texture.[69] These five patterns thus assume a five-tiered ranking in the rhythm section's balance.[70] As the most foregrounded, the mambo bell's metrical dissonance value counts five times in the calculation; the value of the lowest ranked,

[68] The following musical examples will better illustrate this type of calculation.
[69] The *campana* usually projects well, just behind the mambo bell. This is true for all of the recording's other *montunos*.
[70] If two patterns are of equal foregrounding in the texture, both receive the same calculation ranking.

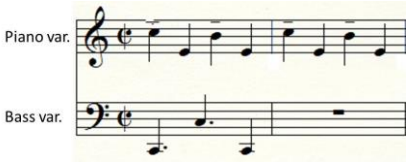
barely audible *campana* pattern only counts once; and so on. Then, the average adds up all of the values and divides by the total count (see Figure 6 for an illustration of the calculation). Given that most of the patterns are quite metrically dissonant and the only metrically consonant pattern is hidden in the texture, this *montuno* sounds highly metrically dissonant. This perceived sound is mirrored by the calculation illustrated in Figure 6: a very high contextual metrical dissonance value (4.5), much higher than the general HEP value calculated above (3.6). This refined calculation allows a more precise comparison of contextual metrical dissonance levels for sections with the same rhythmic profile.

Figure 6: Balance and contextual metrical dissonance level for the final *montuno* of "Aléjate" (the dot represents the calculated value)



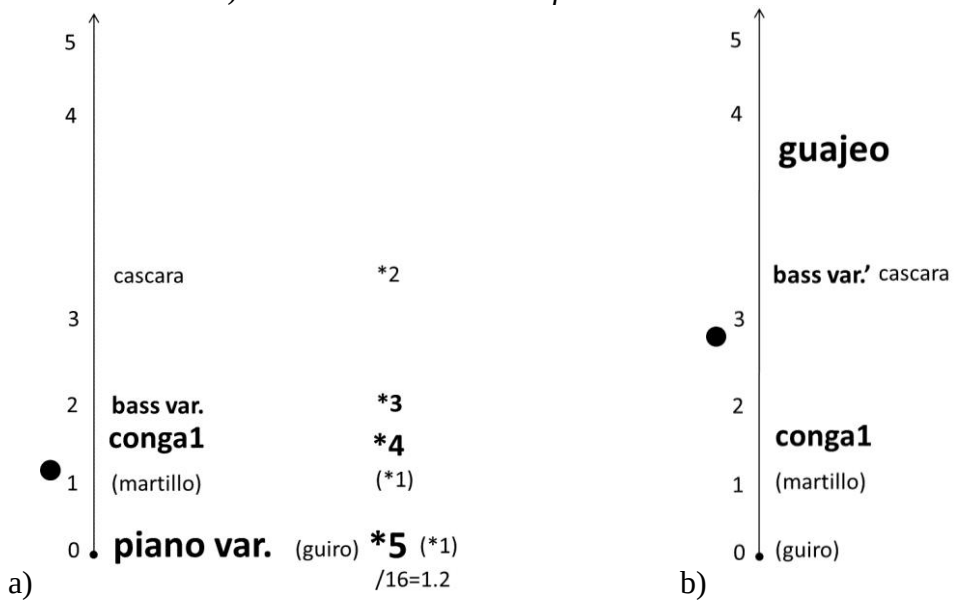
The first *estrofa* of Marc Anthony's recording of "Tu amor me hace bien" provides a more complex example by measuring and comparing contextual metrical dissonances with both variation and balance considerations. Transcribed in Example 13, two variations appear in the first sixteen measures of this *estrofa*'s LEP [t.s. 0:35-0:54]: a thinly-voiced string of quarter notes in the piano part and the aforementioned bass variation, here played only every other measure. As can be seen in Figure 7a, these measures foreground its rhythms in the following order: the metrically-consonant piano variation, then the one-drum conga pattern, bass variation, and *cáscara* pattern. Behind the *cáscara* pattern, both the *martillo* pattern and a pattern of a half note followed by two quarter notes played on the *guiro* (a ribbed gourd) hide in the very back of the texture.[71] Given the two variations' more metrically consonant values and the designated balance, the contextual metrical dissonance value is remarkably low (1.2)—see Figure 7a—which is noticeable in sound and in a calculation comparison (to the general value of 2.5).

Example 13: The piano and bass variations in "Tu amor me hace bien:" from first two measures of the first *estrofa* [t.s. 0:35-7] (The rhythms repeat, while the pitches change.)




[71] Because the *martillo* and *guiro* patterns are equally ranked in the background, metrical dissonance values of both patterns only count once. With six patterns and two in the lowest of the five-tiered ranking the total count is 16 (5+4+3+2+1+1).

Figure 7: Balance and contextual metrical dissonance levels for the a) first sixteen measures and b) the rest of the first *estrofa* in "Tu amor me hace bien"




Past these sixteen measures, though, an energetic shift occurs during both *estrofas* due to pattern changes—with differing levels of metrical dissonance.[72] Still focusing on the first *estrofa*, the rhythmic activity increases in its sixteenth measure due to the trombones inserting two beats of accented eighth notes into the texture [t.s. 0:53-0:54].[73] This increase in rhythmic activity and energy seems to stimulate the pianist to play its more metrically dissonant *guajeo* pattern and the bassist to play a more metrically dissonant variation for the rest of the *estrofa* (Example 14). Maintaining the same balance as before, the contextual metrical dissonance level now rises to a higher value (2.8), due to the more metrically dissonant instrumental patterns (Figure 7b). One can even hear the recording's energy increase at this change as well.

[72] Both *estrofas* are largely the same, however the second portion of the first *estrofa* has a clearer rhythmic foregrounding, and the second *estrofa*'s transition to the higher energy level is not as smooth.
[73] In the second *estrofa*, the pianist performs the same sixteenth-note interjection [t.s. 2:47-8].

Example 14: The second bass variation in "Tu amor me hace bien:" from the seventeenth and eighteenth measures of the first estrofa [t.s. 0:55-7]

These examples demonstrate two important aspects of analyzing contextual metrical dissonance levels. First, formal sections with HEP always have higher levels of metrical dissonance (and energy), whether comparing general ranges or specific values. Second, those specific values—which address unique combinations of variations and rhythmic foregrounding—highlight distinctions between formal sections (or even phrases!) with the same rhythmic profile. The calculations thus offer a way to compare either widely or slightly different contextual metrical dissonances.

## 3: METRICAL DISSONANCE IS RHYTHMIC ENERGY

Malin considers syncopation to have metaphorical, musical energy. [74] The above analyses underscore this positive correlation between metrical dissonance level and perceived energy level. In accord, if one were to replace the phrase metrical dissonance level with energy level in the preceding sections, the above discussions would include the exact energetic associations by salsa scholars. For example, formal sections associated with high energy use HEP and its higher level of contextual metrical dissonance; the opposite is also true. Furthermore, rhythmic instruments' energy associations match its

[74] Using Malin as a theoretical foundation, I consider the relationship to be so strong that the terms metrical dissonance and rhythmic energy are interchangeable. For salsa, I couldn't imagine a simpler way to say contextual metrical dissonance than "rhythmic energy."

pattern's level of metrical dissonance.[75] The nearly metrically consonant patterns for the softer sounding bongos from LEP has associations with low energy, and the most metrically dissonant pattern of the loud and foregrounded mambo bell from HEP has associations with high energy.[76] Explained further below, energetic motives that increase energy levels have corresponding rhythmic changes that increase the preceding levels of metrical dissonance and rhythmic activity.[77]

Given this strong and positive correlation, rhythm is a significant factor in explaining how one might hear energy in salsa music. Adding to Malin's assertion that syncopation converts into energy, differing degrees of syncopation yield different levels of energy. Due to the strength of the correlation, the following energetic analyses refer to rhythmic energy rather than metrical dissonance—since both terms describe the same phenomenon.

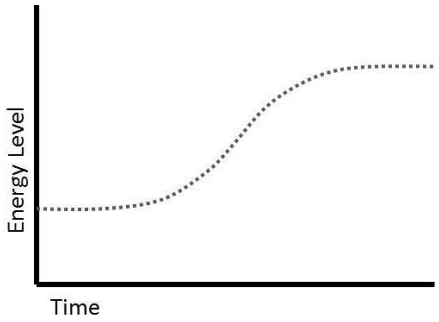
## 4: ENERGETIC MOTIVES

Some of salsa's standard musical motives act as links between formal sections and phrases. These highly characteristic motives, furthermore, appear at junctions where the following material has a higher energy level than the preceding music. Thus, the motive's connective material also increases the energy level to smoothly transition to the

[75] The *campana* is the only instrument whose pattern's metrical dissonance level contradicts its associated energy level; however, the loud *campana* only performs within the context of HEP, during high-energy formal sections. Its formal-section association—plus its pairing with the other bell, the high-energy and highly metrically dissonant mambo bell—motivates its high energy association.
[76] Dynamics cannot be the only factor at play because, with modern recording technology, any instrument can be foregrounded by manipulating specific volume levels.
[77] These points of rhythmic change also often have corresponding changes in other parameters.

following section. Figure 8 charts a graphical representation of perceived energy increase due to both formal and phrasal links. It is the rhythmic features of these motives—particularly their heightened metrical dissonance and rhythmic activity (compared to the preceding material)—that motivates the perception of rising energy. Some motives also engage other parameters (such as contour, orchestration, and dynamic) that contribute to the perception of energy-level increase. The following discussion of multiple parameters enables the demonstration of how they similarly and simultaneously affect energy levels and how energy can transfer from one parameter to another in this repertoire.[78]

Figure 8: Graphic image representing the perceived change in energy level from energetic motives




Phrasal and formal links have differing degrees of energetic effect.[79] With a phrasal link, the energy typically changes on a smaller scale; only slight musical changes occur within a given formal section, not including the rhythmic profile. The result of a phrasal link would change the energy but only moderately, within the low- or high-

[78] In the following examples, significant non-rhythmic occurrences serve only as enhancement upon rhythm's effects on energy.
[79] Both types of links would have the same graphical shape and function, but formal links would have a steeper slope (and phrasal links flatter).

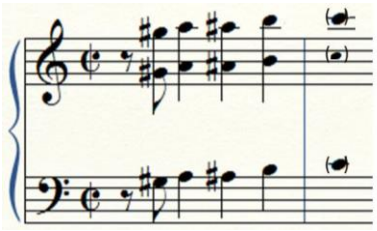
energy range. With a formal link, the motive has a more dramatic presentation with more drastic effects on the energy level: changing rhythmic profiles, orchestration, and energy levels with the new formal section.[80] Below, I will now discuss three motives in Nuyorican salsa that connect energetic levels on either a phrasal or formal level: *pa'lante* link, *tumbao* cadence, and *campana* call-in.

***Pa'lante* Link.** Named for its "get up and go" character, what I call the *pa'lante* link most often connects larger formal sections (transcribed in Example 15).[81] Typically, preceding this motive are long durations—hence less rhythmic energy—during the phrase's closing melodic material. The link's syncopated, accented entrance just one eighth note after the downbeat and its quicker durations introduce proximity to consonance, relative tightness, heightened rhythmic activity, and thus an increase in rhythmic energy. In addition to its rhythmic features, the *pa'lante* link always maintains its rising contour, scale degrees, and resolution to the local tonic.[82] The rhythmic shape also leaps out of the texture for not only rhythmic reasons but also due to its orchestration. The pianist always plays this motive; and either the piano leaps from the rhythmic background directly to the melodic foreground while most of the ensemble is silent, or instrumentalists join the pianist in unison. With this motive's tight and heightened metrical dissonance, increased rhythmic activity, rising contour, foregrounded

[80] Dramatic presentations of a motive would include the motive played in unison by the entire ensemble or all other instruments resting while the motive is occurring.
[81] Some songs use the *pa'lante* link as phrasal link, but this is much less common.
[82] Only one instance in the musical repertoire does the *pa'lante* link not resolve to the tonic, but falls deceptively downward by step to 6. In "El Todo Poderoso" performed by Hector Lavoe, this acts as the link between *estrofas*, and the deceptive treatment of the *pa'lante* link allows for maintaining the same energy level and rhythmic profile for the following *estrofa*. At the end of the second *estrofa*, the *pa'lante* link resolves properly and leads into the higher energy *montuno* with its HEP.

status, and orchestrated emphasis, the *pa'lante* link leads from a lower energy to the more energetic section that follows.

Example 15: The *pa'lante* link

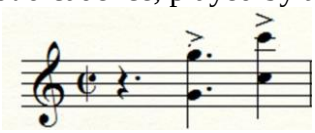


The *estrofas* of "El nuevo swing les toca," as performed by The New Swing Sextet, illustrate the energetic power of the *pa'lante* link. While this motive is a phrasal link amid both *estrofas,* it has the strength of a formal link. At the end of both *estrofas'* first eight-measure phrase, once the rhythm of the foregrounded vocal line has flattened to half note pulses [t.s. 0:07-0:08 and 0:35-0:36], the piano and previously absent *campana* interrupt the vocalists to project the *pa'lante* link [t.s. 0:08 and 0:36]. So greatly intensifying the recording's drive, the motive's rhythmically stimulated energy transfers to the rhythm section and vocalists. This surge of energy motivates an unexpected launching into the more metrically dissonant HEP—which alters the rhythm section's instrumentation—as well as a rise in vocal register and dynamic during the *estrofas'* ninth through twelfth measures [t.s. 0:10-0:14 and 0:38-0:42]. The surprisingly strong energetic results of this phrasal link, though, are only temporary; the *estrofas'* last four

measures fall back to the softer, thinner, and calmer sound of the beginning [t.s. 0:14-0:19 and 0:42-0:50].[83]

***Tumbao* Cadence.** Brief instrumental bridges may also occur between formal sections with differing energetic levels. One highly normative way of concluding this type of bridge, accompanied by LEP, is with a formal link I call the *tumbao* cadence (transcribed in Example 16).[84] This motive matches the rhythm of the bass *tumbao*, and it typically maintains its rising contour and cadential scale degrees: $\hat{5}$ to $\hat{1}$. While this motive often occurs on the piano, it is usually better heard in the doubling trumpets. Discussed in the "individual rhythm" subsection, this rhythm is highly syncopated and therefore quite metrically dissonant; plus, the melodic material preceding the motive typically has longer durations or metrically consonant rhythms in the melodic trumpets. This motive's rhythmic features, as well as those involving other parameters, combine to create the sense of energetic increase that allows energetic flow into the following, high-energy section.

Example 16: The *tumbao* cadence, played by the piano and trumpets



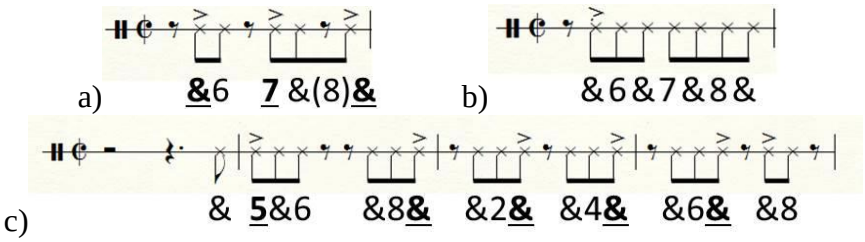
[83] This return allows the second *pa'lante* link to perform the same energy-level increase so that there may be rhythmic contrast upon the eventual and rightful arrival of the HEP with the *montuno*.
[84] The *tumbao* cadence would motivate the switch to HEP with the upcoming formal section. If not accompanied by LEP, there is no support from the rhythm section at all during the link. Mauleón calls this motive a "conga cell" in her guidebook (p. 54), but there is no logical explanation provided for her term.

"El hijo de Obatalá" has two instances of the *tumbao* cadence.[85] The first instance [t.s. 1:09] occurs at the end of an instrumental bridge that connects a low-energy *estrofa* to a higher energy *montuno*. Just prior to this motive, the trumpets play a metrically consonant measure of two quarter notes and a tied half note. Upon the punctuated release of the long note, the syncopated *tumbao cadence* sounds in the trumpets and piano. This formal link's energetic jolt leads directly into the following high-energy formal section.

***Campana* Call-In.** Another extremely common energetic motive is what I call the *campana* call-in.[86] This motive usually serves as a phrasal link to cue or *call in* a new layer into the stratified texture of a mambo or *moña*. Example 17 compiles from the repertoire a few transcriptions of the *campana* call-in's improvised rhythms, since this motive does not have a set rhythm. Despite any variation, the performer preserves the motive's general character; coming toward the end of a (typically eight-measure) phrase, the *campana* player stops its metrically consonant pattern to hammer out a highly syncopated, very active—and therefore far more metrically dissonant improvised—rhythm. Rhythmically and dynamically (with its sudden foregrounding), the *campana* call-in heightens the energy to introduce a new instrumental group into the mixture of sounds. This motive provides a perfect example of Malin's concept of energy transference between parameters: the rhythmic energy transfers into the orchestration, as if the recording gained enough energy to add more players. [87]

[85] For both instances, their instrumental bridges have no supporting rhythmic profiles.
[86] Some recordings such as "Aléjate" use the *campana* call-in as a formal link; however this is more rare.
[87] The element of surprise can come into play with any of these motives. Alterations to these energetic motives may prevent energetic increase or redirect the music to a low-energy section if the motive is adjusted. A deceptive resolution of the *pa'lante* link (described in footnote 82), a downward contour of the

Example 17: Possible *campana* call-in rhythms from a) "Sun sun babaé" [t.s. 1:14] and Willie Rosario's "Lluvia" [t.s. 2:33]; b) his "A maina" [t.s. 2:45] and "Aléjate" [t.s. 5:09]; and c) "El hijo de Obatalá" [t.s. 3:40 and 4:20].




Tito Rodríguez Junior's version of "Sun sun babaé" has an archetypal *campana* call-in during its mambo. The first layer of this recording's mambo has the pianist playing a melodic riff over HEP [t.s. 1:06-1:16]. To cue the horns' entrance, the *campana* player abandons his usual pattern in the mambo's eighth measure for the loud and syncopated rhythm shown in Example 17a [t.s. 1:14]. Using the *campana* call-in as its source of energy, another melodic layer enters the stratified texture (played by the horn section) and in effect doubles the number of playing instruments. Played on a non-pitched instrument, the *campana* call-in relies most heavily upon the rhythmic parameter to perform this important energetic increase.

## 5: ENERGETIC TRAJECTORY

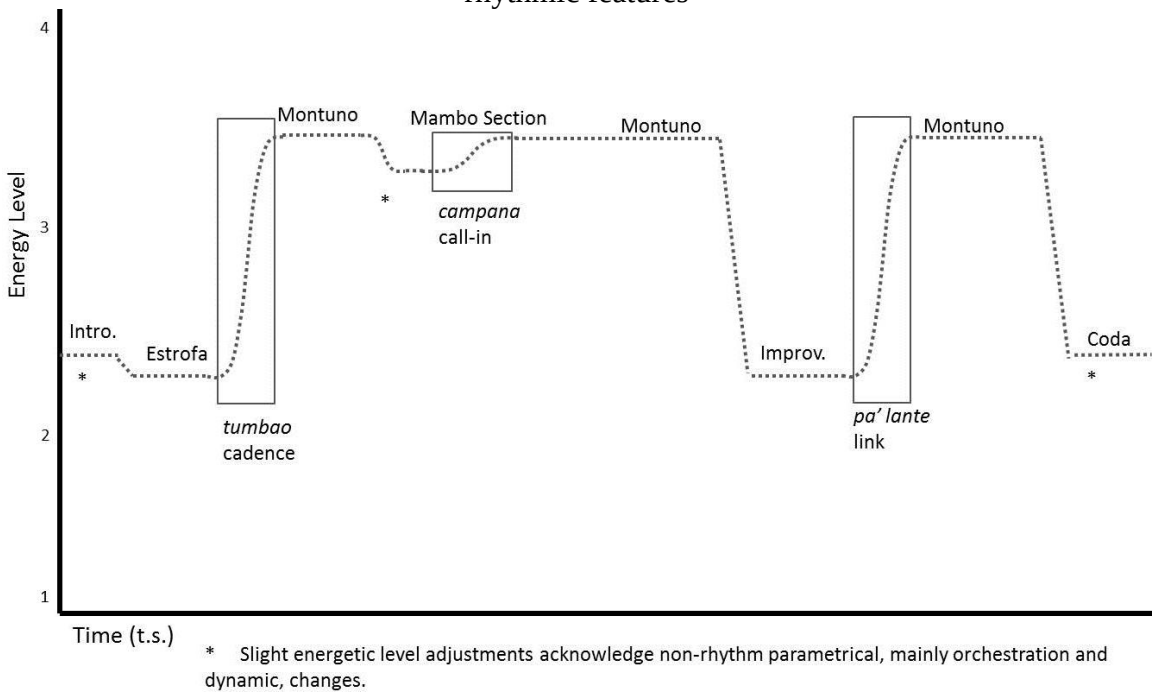
The formal sections' energy levels and the connecting energetic motives combine to produce salsa's rhythmic energy trajectory. This trajectory is the temporal charting of the energy's flow throughout a song. Given its temporality, formal organization is also

*tumbao* cadence, or a metrically consonant ending to the *camapana* call-in all inhibit the energetic function of these motives. These unanticipated changes would be striking for the enculturated listener.

essential. As seen in Figure 9, the general exemplar includes two general energy levels for the formal sections—dictated by their rhythmic profiles—and rounded slopes which represent energetic motives at points of energetic change, all organized according to the form. Adding a bit more nuance, slight level adjustments (marked with asterisks in the figure) illustrate non-rhythmic parameters that also contribute to energy perceptions such as orchestration and dynamic.[88] Introductions and codas seem to have elevated energy levels than estrofas and low-energy improvisations because they have denser textures with the full horn section (as opposed to a solo vocalist or improviser) and thus a higher dynamic. If a mambo has staggered entrances, it begins with a reduction of the usually full texture to only one melodic line and thus drops in energy level; from there, the mambo builds orchestrationally, dynamically, and energetically. Viewing the final product, the general trajectory aligns with all of the energetic associations referenced at the beginning of this report, and this trajectory is founded primarily upon the rhythmic parameter, salsa's rhythmic energy.

[88] It would be difficult to illustrate the *campana* call-in's effects if non-rhythmic parameters did not affect the trajectory since its acquired rhythmic energy transfers only to such parameters.

Figure 9: A standard energetic trajectory for a salsa recording, primarily based upon rhythmic features




* Slight energetic level adjustments acknowledge non-rhythm parametrical, mainly orchestration and dynamic, changes.

With every musical recording, the energetic trajectory remains generally the same but has adjustments for the unique musical details. The form may have a different ordering, or certain formal sections would have slightly different energy levels due to variations or balance. Additionally, unusual musical moments such as the absence of any rhythmic profile or significant changes in non-rhythmic parameters would alter the energy levels, perhaps even during a formal section! Each of these adjustments tailors the rhythmic energy trajectory to uniquely suit the music it charts. While rhythm is never the only parameter contributing to perceived energy, I consider it the primary contributor in salsa music.

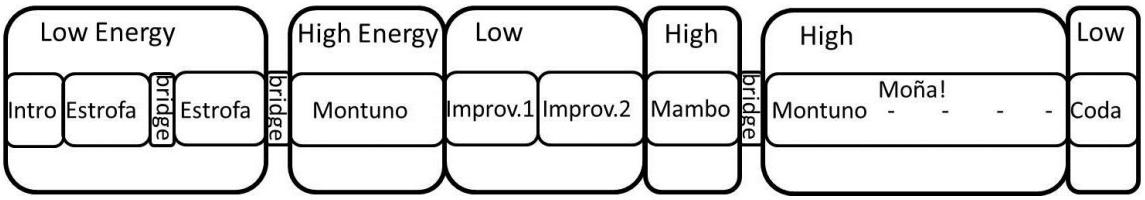
## A FULL RHYTHMIC ENERGY ANALYSIS, EXEMPLIFIED

Below is a rhythmic analysis that applies this method to a complete recording, "El hijo de Obatalá," as performed by Ray Barretto. The analysis starts with formal organization, moves to contextual melodic dissonance levels of each formal section, and then pinpoints the interspersed energetic motives so as to chart the final product: the recording's energetic trajectory.[89] This fairly normative recording exemplifies rhythmic profiles refined by variations and balance and includes each of the energetic motives discussed above, thus making it an ideal exemplar for charting rhythmic energy in salsa.

**Form.** From Figure 3, the formal structure of "El hijo de Obatalá" reappears below in Figure 10, grouped by energy-level association. The most remarkable aspects of this recording's form are the locations of the improvisations and the layered moña.[90] It is less common for an improvisation to split the *montuno*-mambo pairing, but the flexibility of the form accommodates this arrangement. More unusual, the final forty-eight measure *montuno* section has a *moña* layered atop its middle sixteen-measure phrase. Dense full-ensemble orchestration rarely happens, especially with so many melodic segments occurring simultaneously.[91] This intense moment of formal simultaneity greatly impacts the already heightened sense of energy.

[89] Although it focuses large on rhythmic aspects, this trajectory will also acknowledge orchestrational and dynamic factors that seem to contribute to energetic perceptions.
[90] One interesting facet of the form's mambo is that it starts with a harmonized, homophonic melody and then moves to a stratified texture with staggered entrances, as opposed to selecting one of these textures; however, this lengthy mambo is not nearly as remarkable as the other moments detailed in the text.
[91] Horns often do not double the *coro* because they would cover the vocalists' sound, and even with horn interjections during an estrofa, the full vocal section is not performing.

Figure 10: The formal structure of "El hijo de Obatalá," reproduced




**Contextual Melodic Dissonances.** This recording's contextual metrical dissonance levels match the rhythmic-profile ranges identified previously. All formal sections with LEP have a lower value and therefore energy level than those with HEP. Taking into account rhythmic foregrounding and pattern variations, more refined comparisons become apparent between energy levels with the same rhythmic profile. Detailed below, the improvisations are more metrically consonant than the introduction, *estrofas*, and coda; and the mambo is more metrically dissonant than the *montunos*.[92]

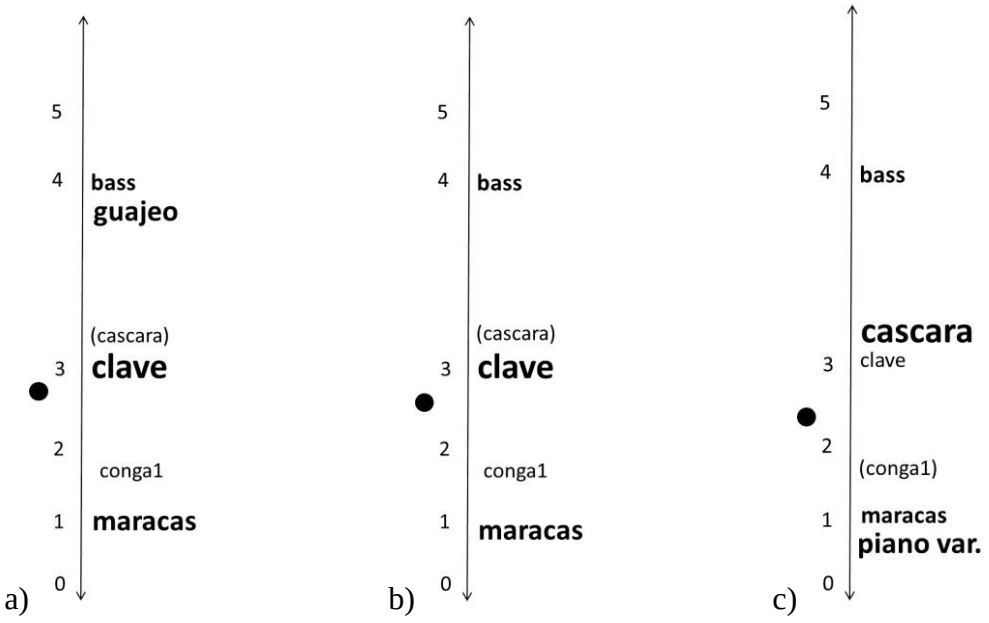
Figure 11 displays the rhythmic foregrounding and contextual metrical dissonance values for all the formal sections with LEP. The introduction [t.s. 0-0:26], *estrofas* [t.s. 0:26-1:05], and coda [t.s. 4:52-5:08] have an identical and standard balance of percussion instruments.[93] With this balance and without any variations, the contextual metrical dissonance value (2.7) fits within the low-energy range for LEP (Figure 11a). Similarly, the first improvisation's rhythmic profile [t.s. 2:01-2:37] is identical in balance except that the improvising pianist becomes a melodic instrumentalist rather than a rhythmic

[92] Given that the *moña* moment occurs during an ongoing *montuno* and given that there are no changes to the rhythmic profile, the *moña* is not considered its own formal section, nor will it have its own contextual metrical dissonance calculation. All *montunos* have the same level of contextual metrical dissonance in the rhythm section.

[93] One small point of interest is that, instead of playing its *martillo* pattern, the *bongocero* covers and foregrounds the otherwise absent clave pattern.

accompanist (Figure 11b). With the removal of the metrically dissonant *guajeo* pattern from the rhythmic profile, the contextual metrical dissonance value drops slightly (2.5).

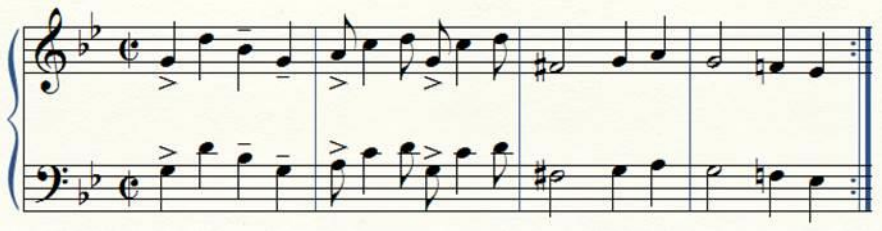
Figure 11: Balance and contextual metrical dissonances levels for formal sections with LEP: a) introduction [t.s. 0-0:26], *estrofa* [t.s. 0:26-1:05], and coda [t.s. 4:52-5:08]; b) first improvisation (piano) [t.s. 2:01-2:37]; and c) second improvisation (conga) [t.s. 2:37-3:27]




As shown in Figure 11c, the value drops again (to 2.3) during the *conguero*'s improvisation [t.s. 2:37-3:27] due to rhythmic variation. When the pianist reenters into the rhythm section's supporting texture, the variation chosen is nearly metrically consonant. The transcription in Example 18 shows that the pianist adds a few accented notes to fill in a one-measure rhythm comprised of a half note followed by two quarter notes. Once the conga leaves the rhythmic profile, the *campana* enters and leaps to the

front of the texture, beating out the *cáscara* pattern on the most resonant portion of the bell.[94] These changes slightly lower the rhythmic energy level.

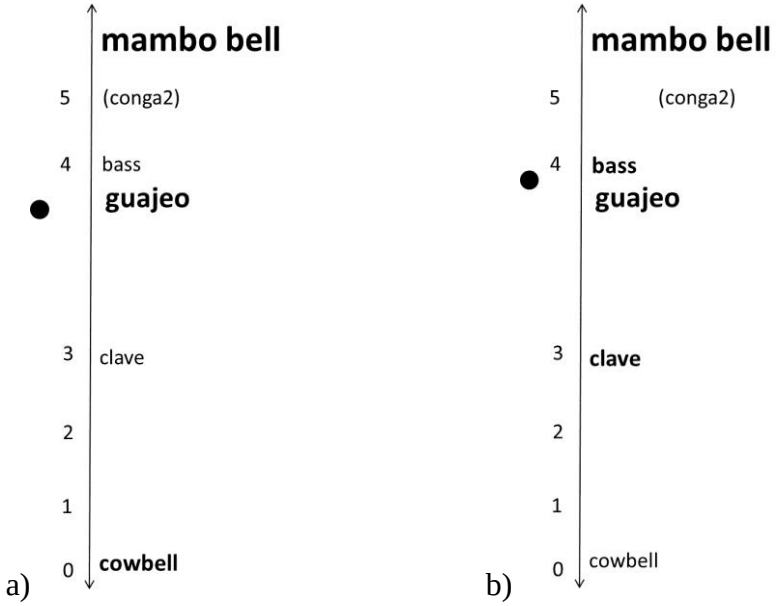
Example 18: Piano's variation during the conga improvisation [t.s. 2:37-3:27]



For the formal sections with HEP, balance differences cause slight value discrepancies (as shown in Figure 12). Without variations, both *montunos* [t.s. 1:10-2:01 and 3:59-4:51] have an identical balance, therefore an identical contextual metrical dissonance value (3.7), comfortably within HEP's high-energy range. The mambo [t.s. 3:27-3:55] has a slightly adjusted balance; the *campana* moves from the middle of the rhythm section's texture to the background, covered by all but one of the other percussion instruments. The metrically consonant pattern's retreat to the background results in a higher contextual metrical dissonance value (3.9) and energy level, beyond that of the *montunos*.

[94] At this point, the *bongocero* (also the *campana* player) and *timbalero* switch rhythms; the *timbalero* covers the clave pattern on a woodblock.

Figure 12: Balance and contextual metrical dissonance values for the a) *montunos* [t.s. 1:10-2:01 and 3:59-4:51] and b) mambo [t.s. 3:27-3:55]




**Energetic Motives.** Between these formal sections are the three motives that link both musical passages and their energy levels. As is standard, the *tumbao* cadences and *pa'lante* link act as formal links, and the *campana* call-in's are phrasal links. The first energetic motive, a *tumbao* cadence [t.s. 1:09], closes an instrumental bridge between the second *estrofa* and first *montuno*, and the second motive, a *pa'lante* link [t.s. 3:26], then connects the second improvisation to the mambo. Both of these motives occur when a low-energy formal section is followed by a higher-energy section; therefore, the motives provide a surge of rhythmic energy to connect these otherwise dissimilar and energetically disjunct musical segments. The second *tumbao* cadence [t.s. 3:56] connects two relatively high-energy sections—the mambo and the second *montuno*. Both bridges ending with this motive, however, have a distinct feature: in both cases, the entire rhythm

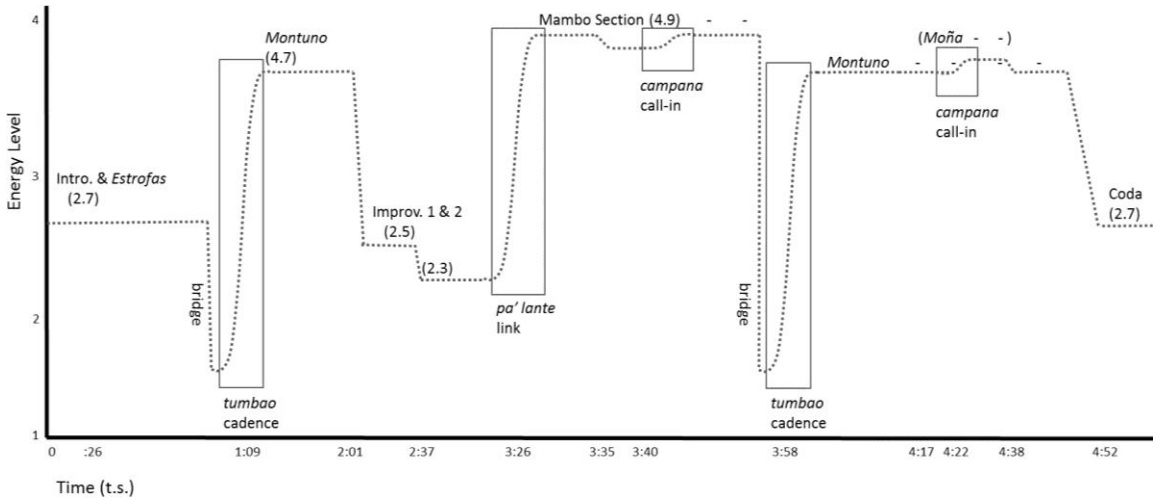
section drops out of the texture completely for the entire bridge.[95] This silence creates an even larger energetic gap to fill: from nothing to a highly metrically dissonant rhythmic profile. In this way, both tumbao cadences function with equal strength as formal links.

The two *campana* call-in's assume their customary role of introducing a new layer to the stratified textures of the mambo [t.s. 3:40-44] and *moña* [t.s.4:22-26]. Transcribed in Example 17c (from the section describing this motive's features), both *campana call-in*'s [t.s. 3:40 and 4:22] are identical rhythmically and unusually long, but they behave typically. After the motive's cue in the mambo, the trumpets add their own melodic riff ontop of the piano's melodic layer; in the *moña*, the higher trumpets add a harmonizing layer to the lower trumpet's melodic riff. All of these motives provide and transfer the rhythmic energy to assist the energetic flow of the recording.

**Energetic Trajectory.** Connecting all of this general analytical information together, one can see the basic shape of the recording's energetic trajectory and feel the energetic flow unfolding over the recording's five minutes. As we can see in Figure 13, the rhythmic energy— motivated by metrical dissonance—flows through the entire form, corresponding to the change of rhythmic profile and linkage by the motives.

[95] This does not include the brief doubling of only the *tumbao* cadence in the piano.

Figure 13: The general energetic trajectory for "El hijo de Obatalá," compiling the energy levels and changes from the above rhythmic analysis[96]




The *campana* call-in's included in Figure 13, however, address an issue otherwise unaccounted for in this more general chart: non-rhythmic parameters. Added in Figure 14, slight energy-level adjustments due to orchestration and dynamics (marked with asterisks) yield an even more nuanced representation of the energetic flow of the recording. The common adjustments are as follows: the introduction and coda have slightly more energy than the *estrofas*, and the start of a mambo's staggered entrance segment has a reduction in energy level. Also, a *moña* overlapping a *montuno* (discussed in the form paragaph) is rare and quite intense, and this full-ensemble sound and melodic variety raises the energy level even higher with each staggered entrance. This rhythmic analysis—acknowledging other parametrical contributions—identifies and traces the recording's rhythmic energy, and this shape charts the unique energetic trajectory for "El

[96] The sudden drops at the bridges illustrate the rhythm section's silence.

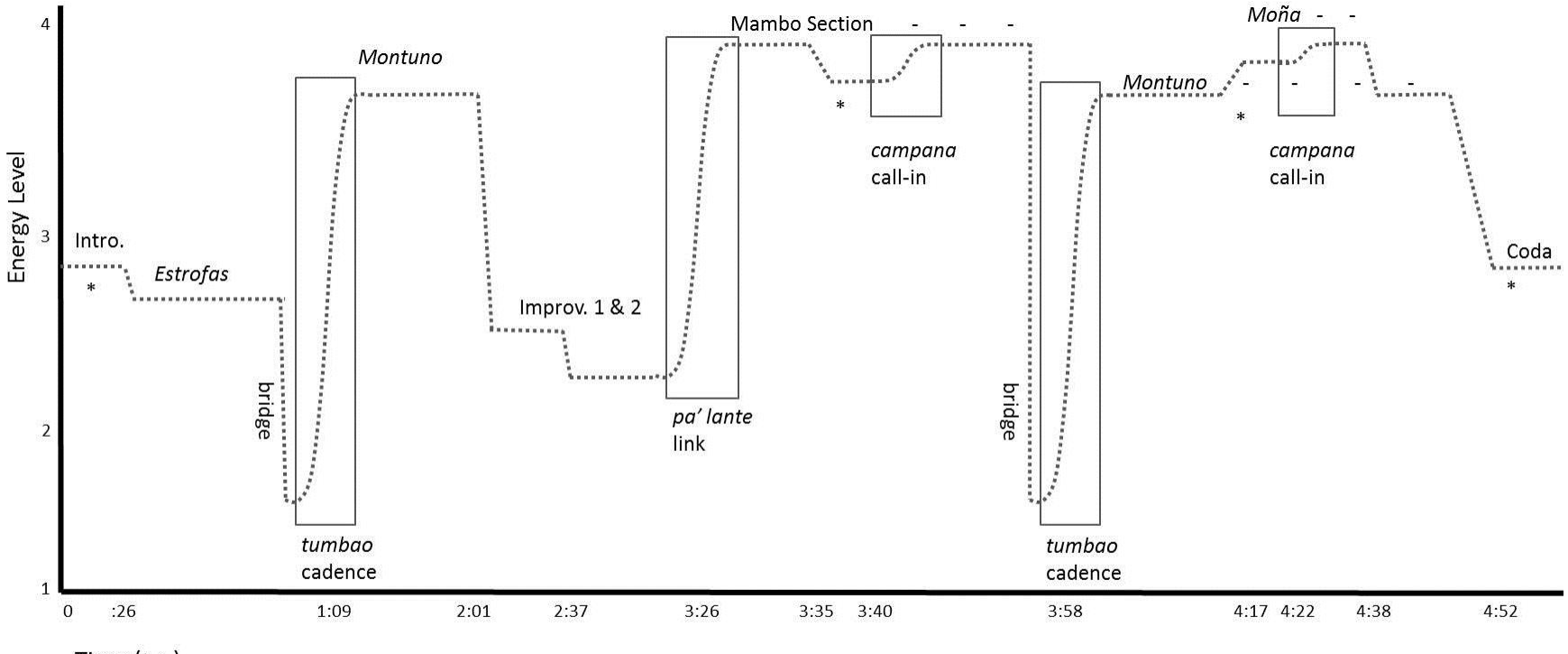
hijo de Obatalá." Presented in the proper order, we see how the eneregetic motives lead into higher energy sections. All energy levels derive from the metrical dissonance of the participating rhythms, their balance in the texture, and other aspects from non-rhythmic parameters specific to that formal section or phrase. Most importantly, this rhythmic energy trajectory—based upon metrical dissonance factors—illustrates the perceived energetic associations in salsa music.

## Conclusions

This report outlines a method for charting a recording's perceived energetic trajectory to show how changes in metrical dissonance in the rhythm section provide musical evidence to support widely held notions of salsa's rhythmic energy. Metrical dissonance in individual rhythms, formally organized rhythmic profiles, and linking motives match the perceptions of energy; this rhythmic analysis, therefore, validates with music-theoretical evidence the energetic associations from the salsa community. In so doing, this report expands Krebs's and Malin's rhythmic theories to a new musical repertoire and could inspire further related research on salsa music.

The present study could lead to other studies on topics such as style analysis or applications to dance. Beyond a single recording, analysis can focus on the broader Nuyorican salsa styles using the same metrical dissonance methods. This study may show that entire styles have higher or lower levels of metrical dissonance due to characteristic foregrounding tendencies or pattern variations and therefore have higher or lower overall energy levels. These differing styles may also have distinctive tempo ranges and trends in

Figure 14: The nuanced energetic trajectory of "El hijo de Obatalá"




* Slight energetic level adjustments acknowledge non-rhythm parametrical, mainly orchestration and dynamic, changes

formal structure, which may produce a unique effect on the shape of the energetic trajectory. Such an investigation could allow listeners to more easily distinguish stylistic trends.

This report's work could also apply directly to dance. Dancing to salsa, whether in performed choreography or social dances, is often about interpreting the music through movement. An author could easily translate the aforementioned analytical findings to benefit the dancer, discussing how they can better reflect salsa's energy levels and rhythmic aspects in their corresponding movements. For example, an intermediate dancer could better reflect the low energy of formal sections with LEP by performing simpler partner-work patterns and smaller gestures of styling; upon the arrival of a *pa'lante* link preparing a passage with HEP, dancers could know to immediately switch to grander styling gestures along with more complex partner-work—both requiring more physical energy. [97] Thus, whether applied to their partner-work, solo foot-work, styling, or even their choice of basic step; a deeper knowledge of salsa's specific rhythmic and energetic features could direct dancers' planned or spontaneous kinesthetic choices. My music-theoretical work on rhythmic energy can offer this type of information to the dancer. Ultimately, this research of rhythmic features may help the dancers dance, the listeners listen, and illustrate the elusive nature of salsa's "rhythmic energy."

[97] As far as I know, salsa celebrity Salomon Amaya is the only dance instructor to educate dancers on such energetic matters, and no scholars have focused on rhythmic energy reflected in salsa dancing.

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